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(54) **Preamble design for multicarrier transmission over channels with multiple inputs and outputs**

(57) One or more preambles are inserted into frames of Orthogonal Frequency Multiplexing (OFDM) -Multiple Input, Multiple Output (MIMO) signals. The

preamble is received by the antennas of a receiver, decoded and compared to known values to provide synchronization, framing, channels estimation, offsets and other corrections to the transmitted signal.

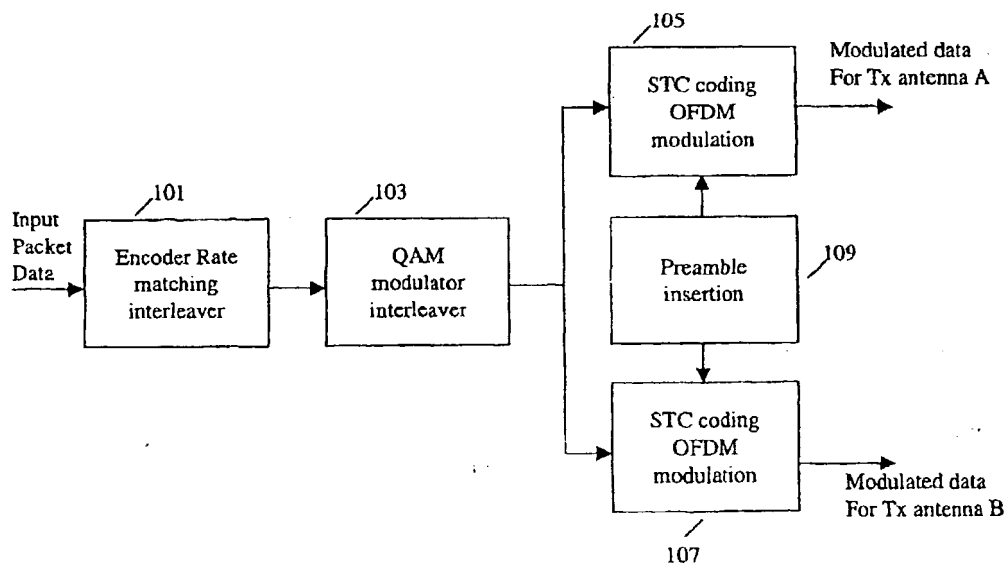


FIG. 1



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EUROPEAN SEARCH REPORT

Application Number
EP 01 30 7304

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	JONES, RALEIGH: "Channel estimation for wireless OFDM systems" IEEE GLOBALTELECOMMUNICATIONS CONFERENCE, 2 - 4 September 1998, pages 980-985, XP000825895 New York, US ISBN: 0-7803-4985-7 * figure 1 *	1,5,9, 13, 17-19,23	H04L1/06 H04L5/02 H04L27/26 H04B7/06
X	CIMINI ET AL.: "Clustered OFDM with transmitter diversity and coding" IEEE GLOBAL TELECOMMUNICATIONS CONFERENCE, 18 November 1996 (1996-11-18) - 22 November 1996 (1996-11-22), pages 703-707, XP000742231 New York, US * figure 6 *	1,5,9, 13, 17-19,23	
X	DANESHRAH ET AL.: "Clustered-OFDM transmitter implementation" IEEE INTERNATIONAL SYMPOSIUM ON PERSONAL, INDOOR AND MOBILE RADIO COMMUNICATIONS, vol. 3, 15 - 18 October 1996, pages 1064-1068, XP000858425 New York * figures 1,2 *	1,5,9, 13, 17-19,23	TECHNICAL FIELDS SEARCHED (Int.Cl.7) H04L H04B
A	MATSUMOTO ET AL.: "OFDM subchannel space-combining transmission diversity for broadband wireless communication systems" IEEE INTERNATIONAL CONFERENCE ON UNIVERSAL PERSONAL COMMUNICATIONS, 5 - 9 October 1998, pages 137-141, XP010314950 New York, US * figures 4,5 *	1,5,9, 13, 17-19,23	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 6 May 2003	Examiner Scriven, P
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>& : member of the same patent family, corresponding document</p>			



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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
E	US 2002/122381 A1 (SHIQUAN WU ET AL.) 5 September 2002 (2002-09-05) * figure 4 *	1,5,9, 13, 17-19,23	
E	EP 1 185 001 A (NORTEL) 6 March 2002 (2002-03-06) * abstract *	1,5,9, 13, 17-19,23	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 30 7304

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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06-05-2003

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2002122381	A1	05-09-2002	CA 2351140 A1	01-03-2002
			CA 2355433 A1	01-03-2002
			EP 1185001 A2	06-03-2002
			EP 1185048 A2	06-03-2002
			US 2002122383 A1	05-09-2002
			US 2002122382 A1	05-09-2002
			US 2002041635 A1	11-04-2002

EP 1185001	A	06-03-2002	US 2002122383 A1	05-09-2002
			CA 2351140 A1	01-03-2002
			CA 2355433 A1	01-03-2002
			EP 1185001 A2	06-03-2002
			EP 1185048 A2	06-03-2002
			US 2002122381 A1	05-09-2002
			US 2002122382 A1	05-09-2002
			US 2002041635 A1	11-04-2002
